

ABSTRACT

Ultra-high-strength linepipes having excellent low-  
temperature toughness manufactured by welding together  
5 the edges of steel plates comprising C of 0.03 to 0.07  
mass%, Si of not more than 0.6 mass%, Mn of 1.5 to 2.5  
mass%, P of not more than 0.015 mass%, S of not more than  
0.003 mass%, Ni of 0.1 to 1.5 mass%, Mo of 0.15 to 0.60  
mass%, Nb of 0.01 to 0.10 mass%, Ti of 0.005 to 0.030  
10 mass%, Al of not more than 0.06 mass%, one or more of  
required amounts of B, N, V, Cu, Cr, Ca, REM (rare-earth  
metals) and Mg, with the remainder consisting of iron and  
unavoidable impurities and having a  $(Hv-ave)/(Hv-M)$  ratio  
between 0.8 and 0.9 at  $2.5 \leq P \leq 4.0$ , wherein Hv-ave is  
15 the average Vickers hardness in the direction of the  
thickness of the base metal and Hv-M is the martensite  
hardness depending on C-content ( $Hv-M = 270 + 1300C$ ) and  
a tensile strength TS-C between 900 MPa and 1100 MPa;  $P =$   
 $2.7C + 0.4Si + Mn + 0.8Cr + 0.45(Ni + Cu) + (1 + \beta)Mo - 1$   
20  $+ \beta$  ( $\beta = 1$  when  $B \geq 3$  ppm and  $\beta = 0$  when  $B < 3$  ppm).